C-111 Spreader Canal Project

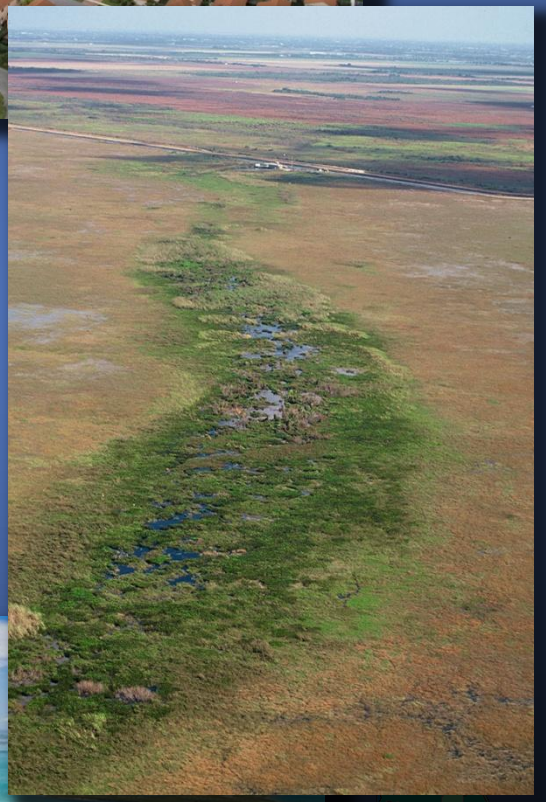
Termination of South Florida Aquaculture, Inc. Lease Agreement

Governing Board Meeting
October 15, 2009

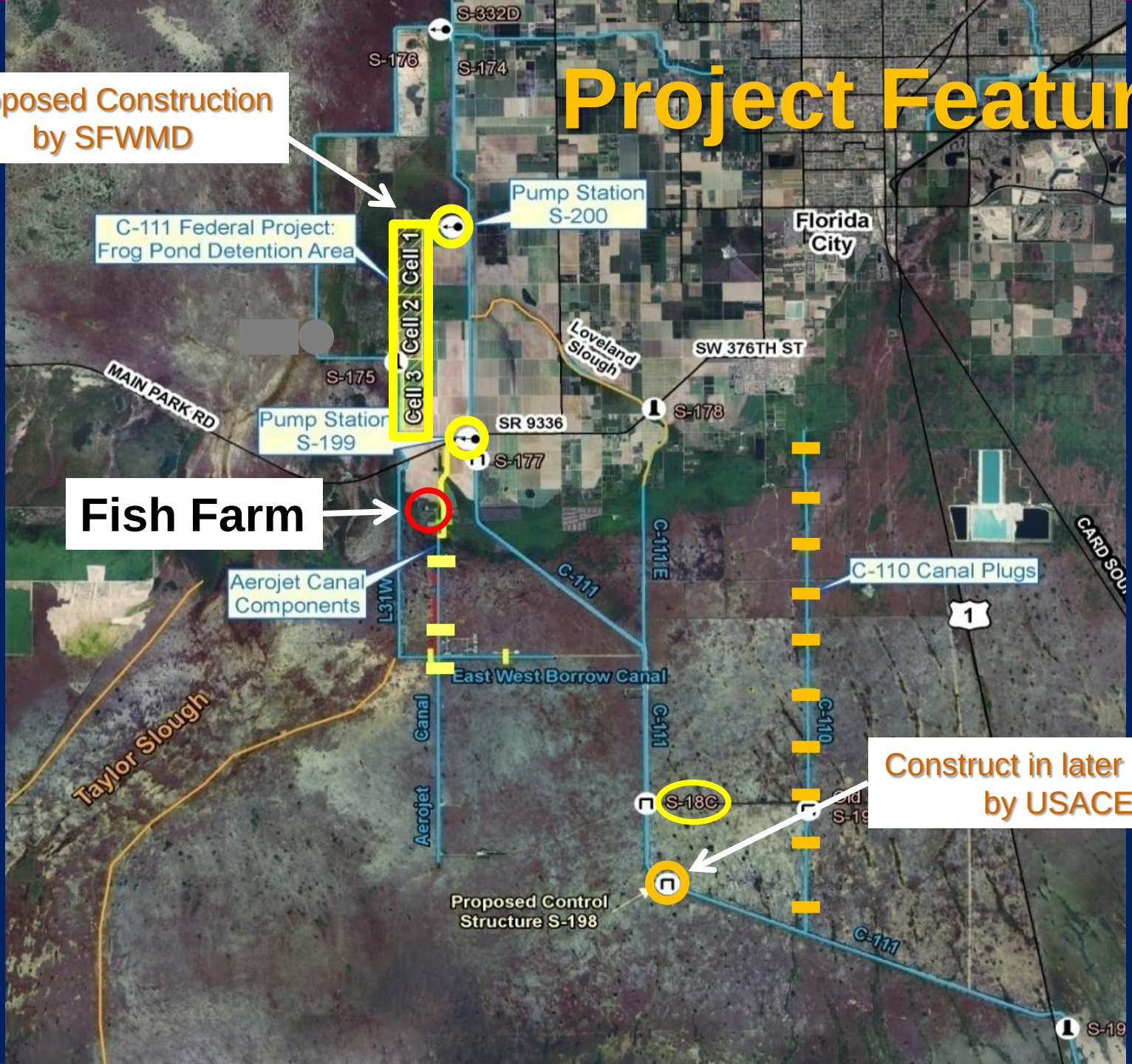
Tommy B. Strowd, P.E.
Assistant Deputy Executive Director
Everglades Restoration and Capital Projects

Project Objectives

- Restore the quantity, timing and distribution of water delivered to Florida Bay via Taylor Slough



Project Features

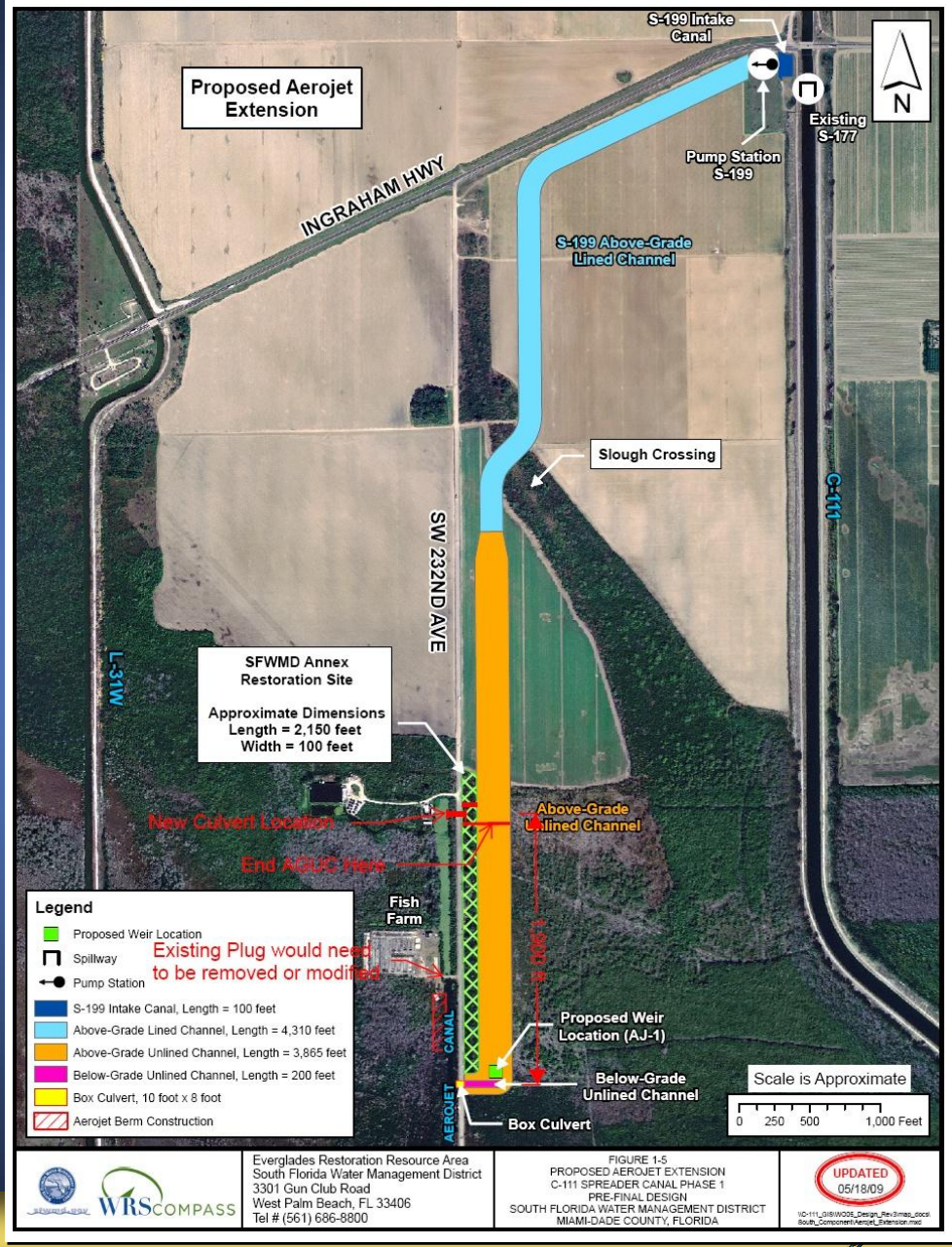


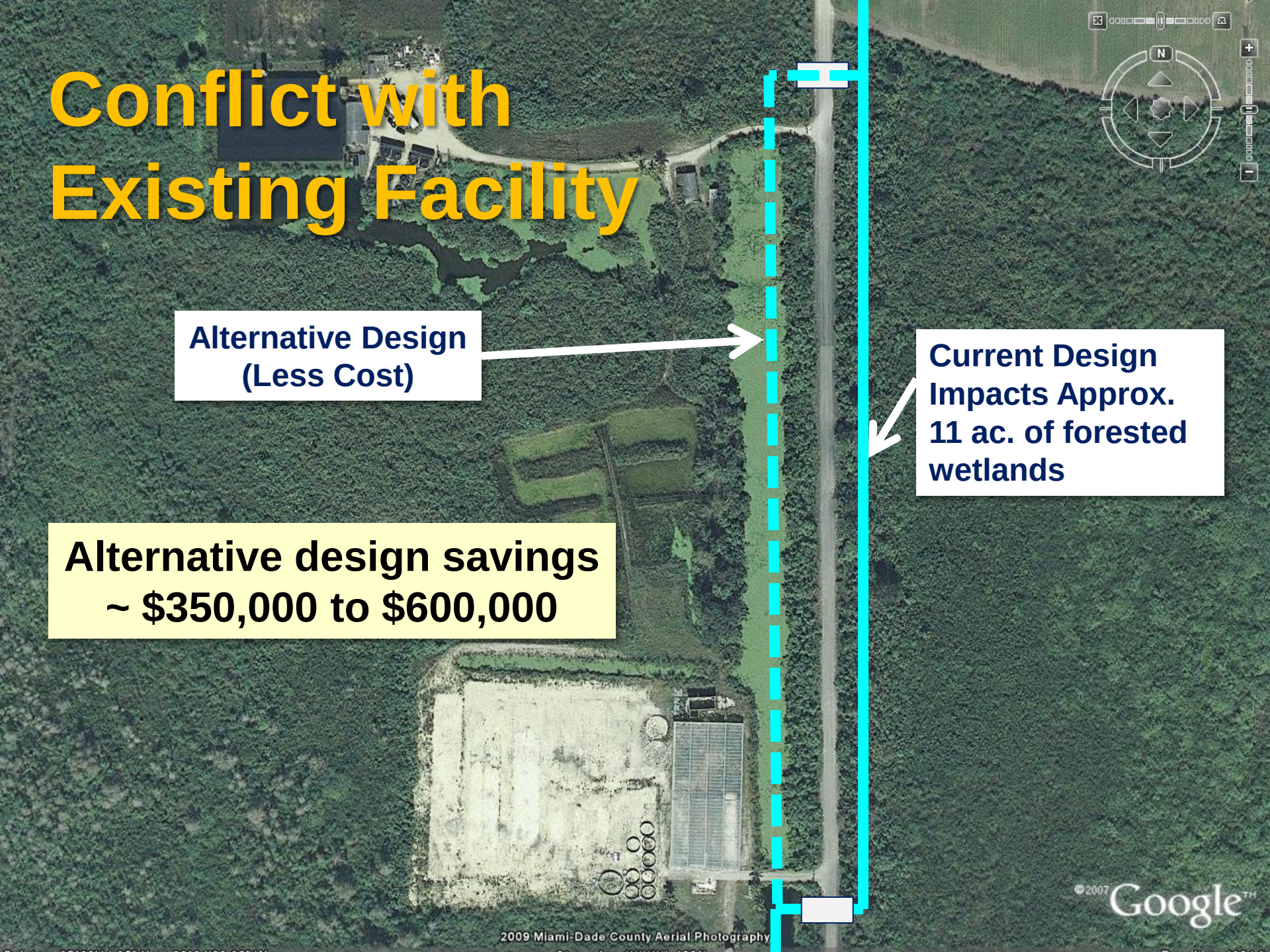
Construction Contracts

- Frog Pond Detention Area
  - Palm Beach Grading, Inc.
  - $10,800,000
- Pump Stations S-199 & S-200
  - Wright Construction Group
  - $7,149,000
- Aerojet, C-110 and L-31E Canal Modifications
  - GlobeTec, Inc.
  - $6,980,000

Fish Farm

- Lease Contract C-7335
  - 48.39 ac.
  - April, 1996 – March 2016
  - Annual Rent: $2,224
    - Plus Productivity Payment based on sales
- Use and configuration conflicts with proposed design
- Water quality issues
- Potential restrictions to operations based on land elevations and proposed water levels
- Staff recommends lease termination




Conflict with Existing Facility
Alternative Design (Less Cost)
Current Design Impacts Approx. 11 ac. of forested wetlands
Alternative design savings ~ $350,000 to $600,000
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Potential Water Quality Issues
Proposed Construction by SFWMD
C-111 Federal Project: Frog Pond Detention Area
Cell 1
Cell 2
Cell 3
Pump Station S-200
Pump Station S-199
Fish Farm
Aerojet Canal Components
Proposed Control Structure S-198
Construct in later phases by USACE
C-110 Canal Plugs
S-332D
S-176
S-174
S-175
S-177
SR 9336
S-178
S-18C
SW 376TH ST
Loveland Slough
MAIN PARK RD
Taylor Slough
C-111
C-111E
C-110
L31W
Aerojet
Florida City

Water Quality Issues

- The diversion of C-111 flows into the Aerojet canal will change the chemical hydrologic characteristic of surface and ground water in the vicinity of the fish farm
- Current aquaculture proposal increases production and relies on treatment technology and BMPs that have not been applied in this region
- There is significant uncertainty associated with proposed operation of the facility based on these changes from the existing condition

Water Quality Issues

- Neptune Industries, Inc. submitted a feasibility analysis yesterday afternoon
- Preliminary review;
  - Requires utilization of the remnant Aerojet Canal and a series of abandoned ponds for water quality treatment of Phosphorus
    - Requires planting, maintaining and harvesting a culture of water hyacinth and water lettuce to maintain necessary treatment capacity
      - Potential introduction of exotic species


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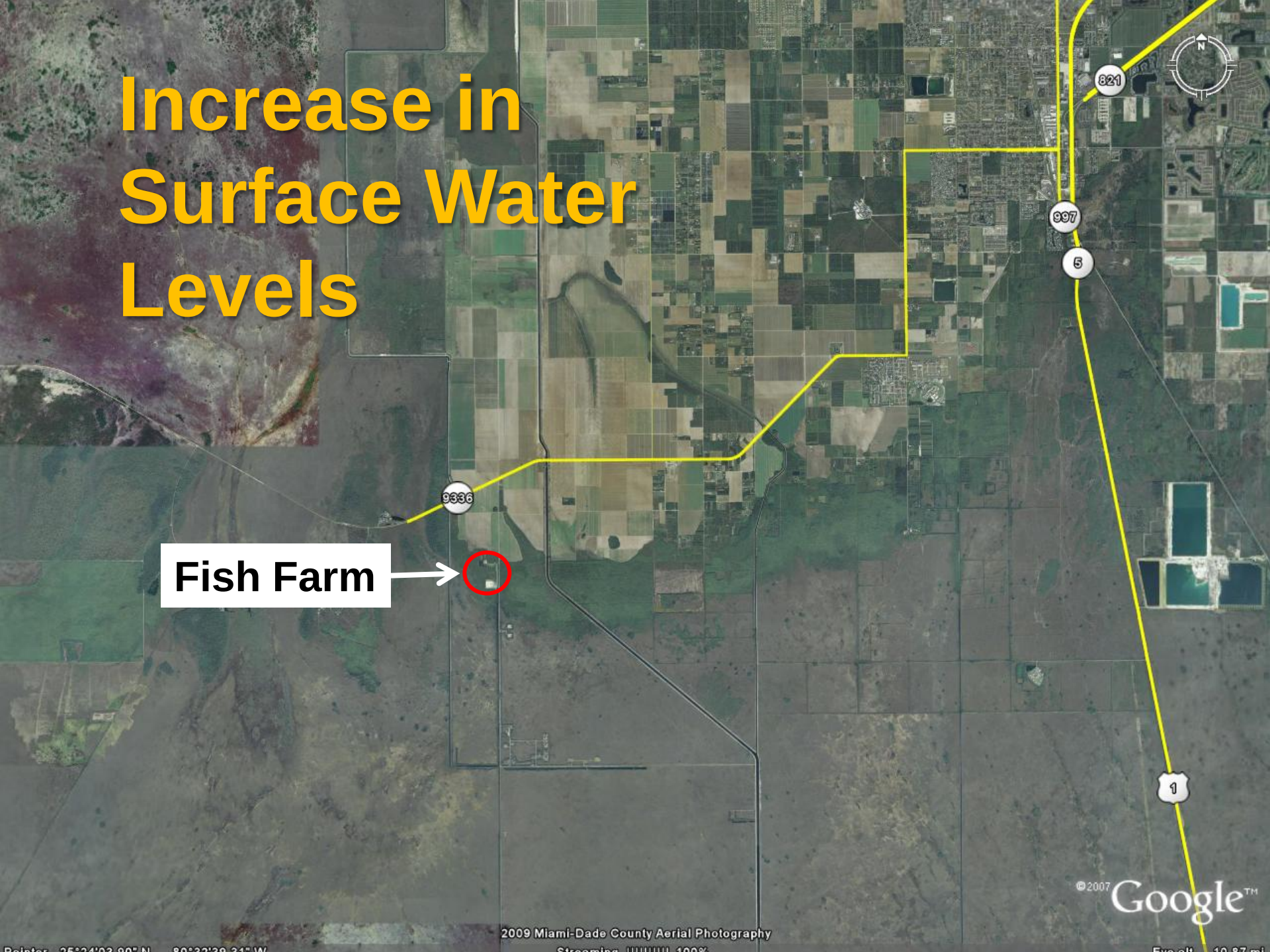
Water Quality Issues

- Because of limited available treatment area and the relatively high volume of effluent
  - The Hydraulic Residence Time (HRT) is relatively short when compared to other wetland treatment systems
    - Neptune Industries, Inc. HTR: ~8 hours
    - Available Literature HTR:
      - Shortest HTR: ~ 19 hours
      - STA HTR: ~ 4 days

Water Quality Issues

- The Neptune Industries Feasibility Report indicates that the conceptual treatment system can treat effluent discharges to approximately 8 parts per million of Phosphorus.
- This is based on data extrapolations outside the current experience base for these technologies
- The report recommends;
  - Aggressive harvesting of aquatic vegetation to achieve the anticipated high P removal rates
  - Pilot scale testing of the proposal to provide information for facilities design.


Increase in Surface Water Levels
Fish Farm
9336
997
821
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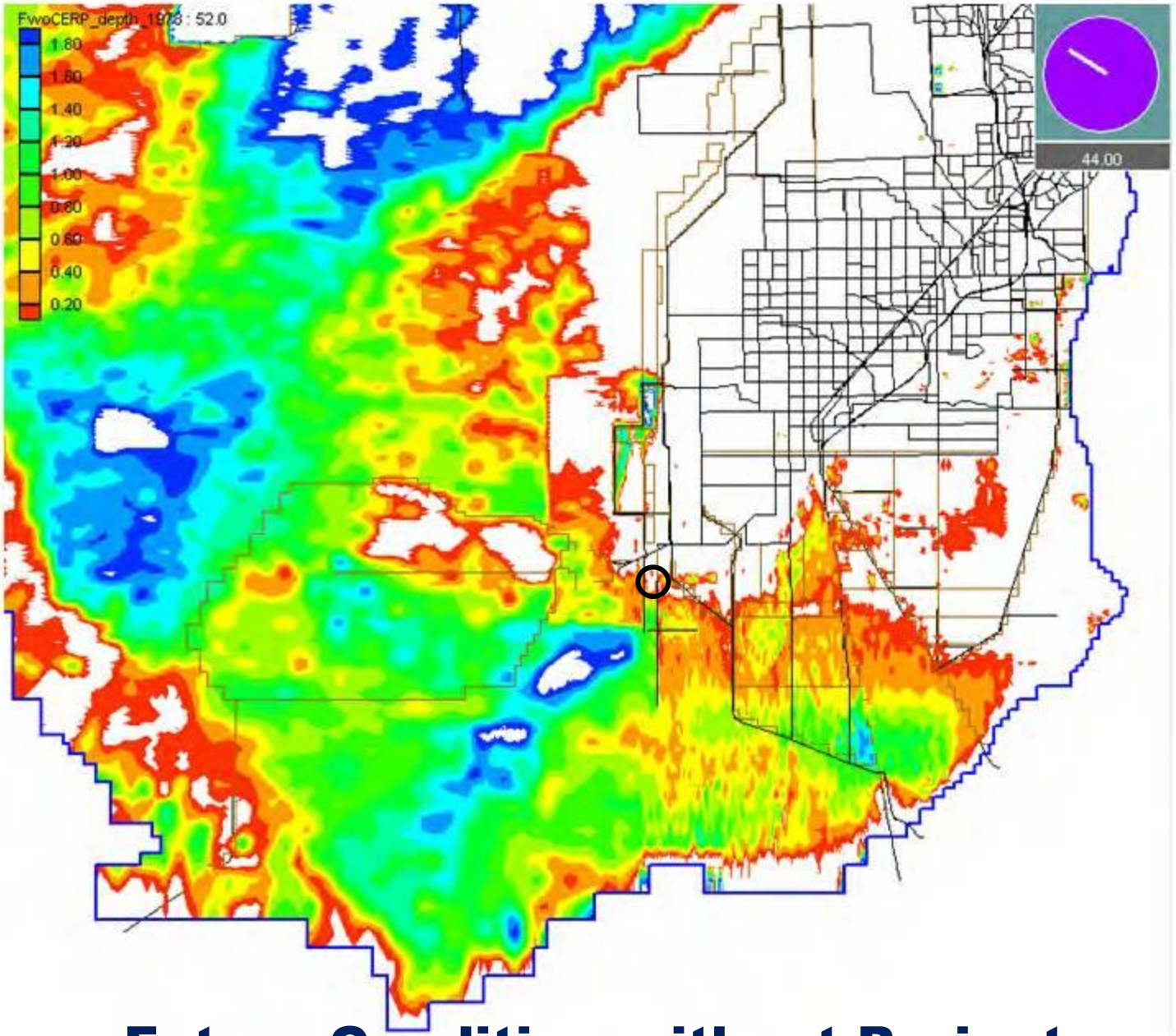
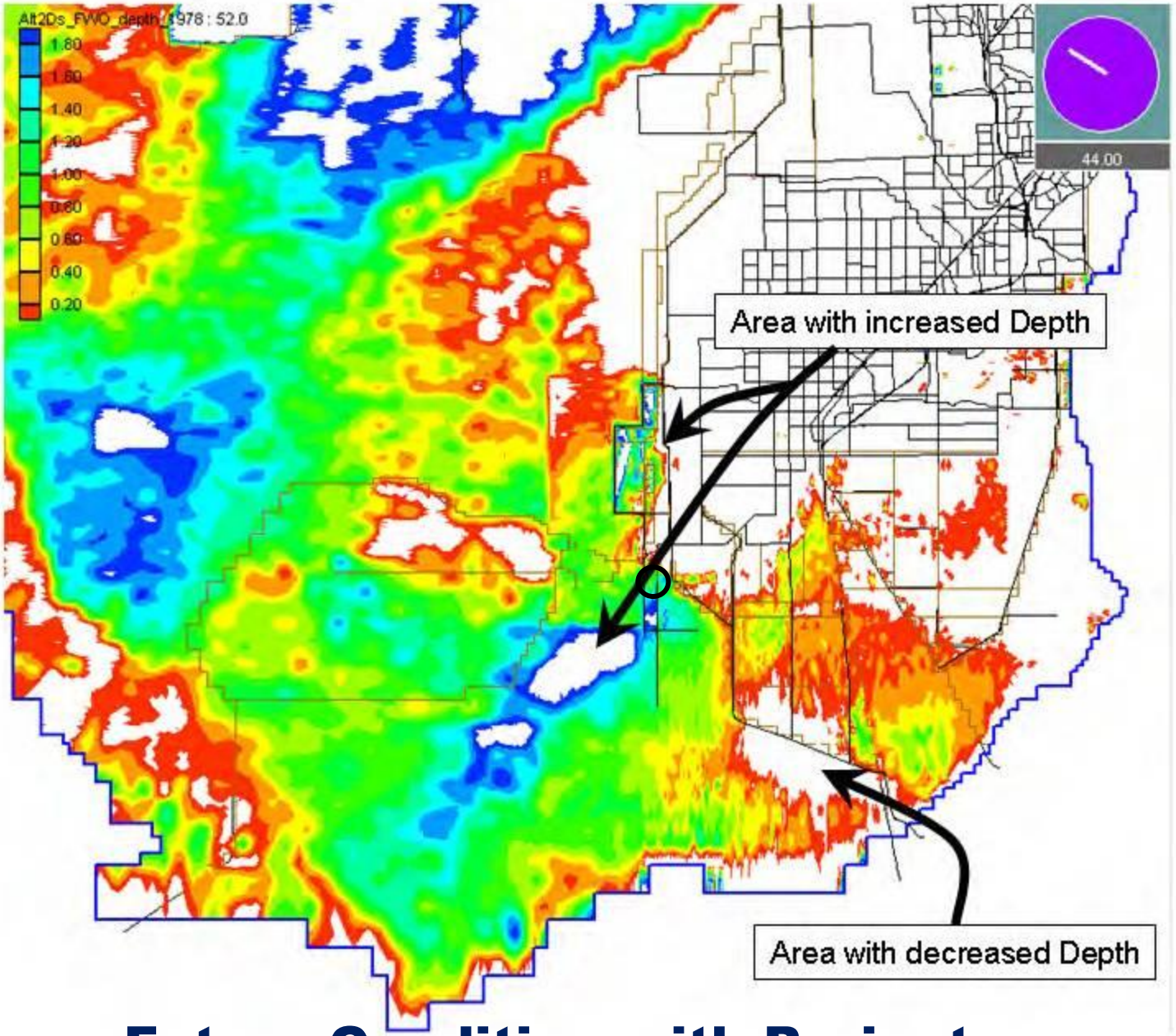
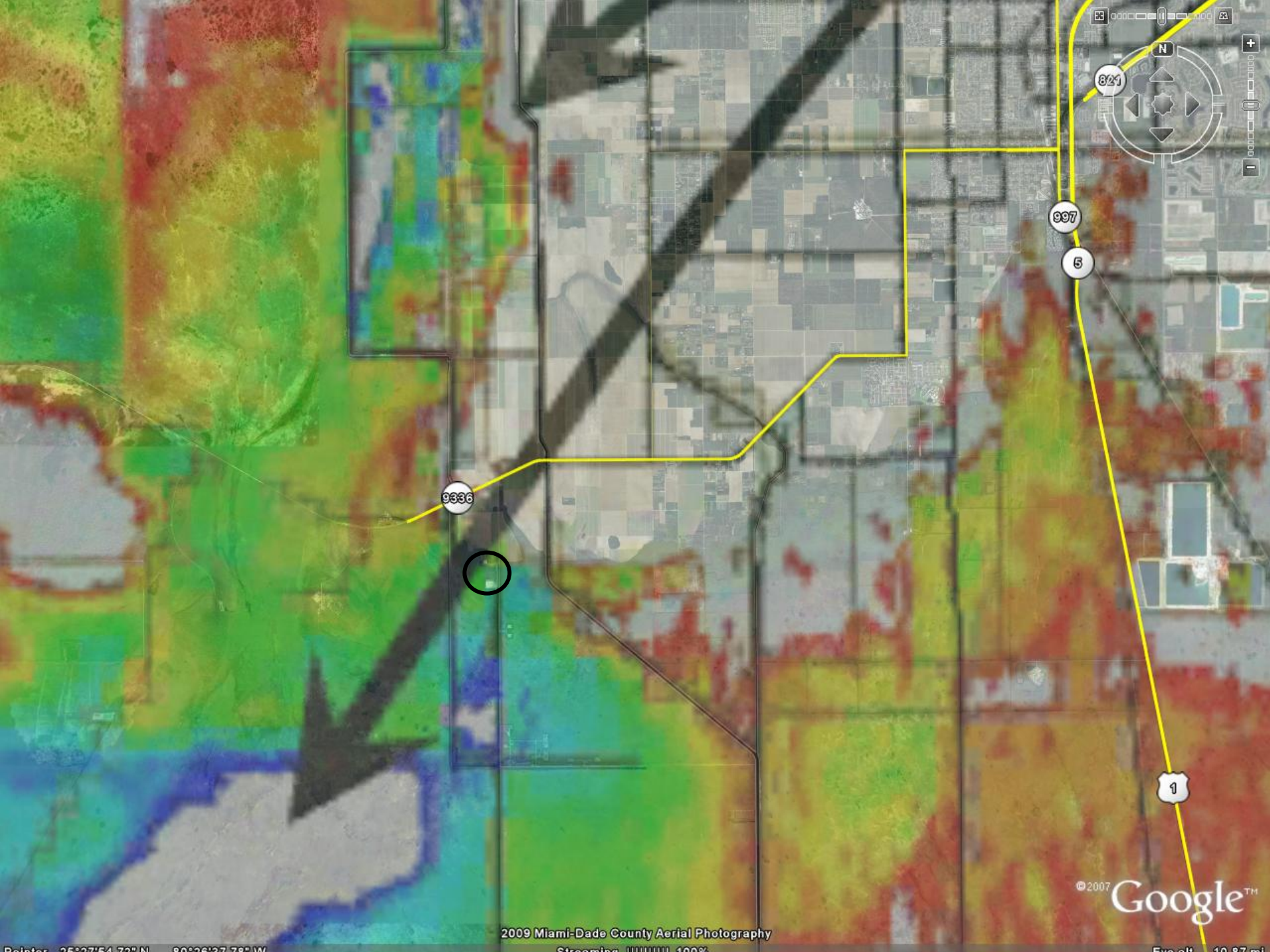


Future Condition without Project



Future Condition with Project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Surface Water Flooding

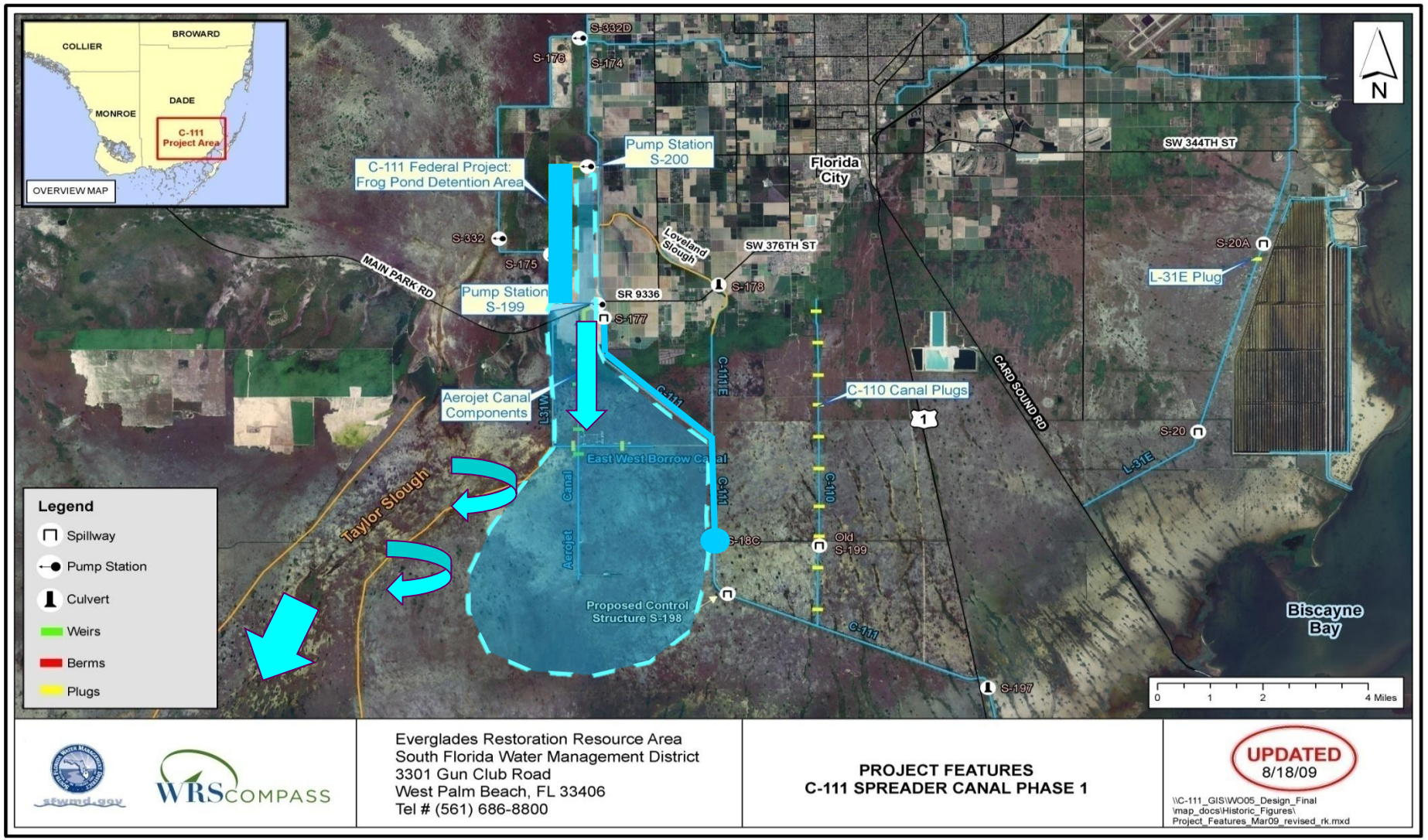
- Representatives of Neptune Industries indicate a capability to work with the anticipated increase in water levels in the region as a result of the C-111 Spreader Canal Project.
- Therefore the proposed facility would not be considered a constraint to canal or pump station operations

Staff Recommendation

- The C-111 Spreader Canal Restoration Plan has been developed, permitted and is ready to begin construction
- Uncertainties associated with the operation of the fish farm and the potential expansion of production is not compatible with proposed restoration operations
- This region is among the most sensitive to water quality changes in the District
- Staff recommends termination of the lease

Discussion

C-111 Spreader Canal, Phase 1



Everglades Restoration Resource Area
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, FL 33406
Tel # (561) 686-8800

PROJECT FEATURES
C-111 SPREADER CANAL PHASE 1

UPDATED
8/18/09

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Water Quality Issues

- Hydraulic Loading Rates (HLR)
  - Available literature for HLR in existing wetland treatment systems ranges from 0.57 to 4.16 grams /square meter/ yr.
  - This facility estimates a HLR of approximately 50.5 g/m^2/yr
- Mass Removal Rate (MRR)
  - Available literature for MRR in existing wetland treatment systems ranges from 0.29 to 2.72 g/m^2/yr
  - This facility estimates an MRR of approximately 33.3 g/m^2/yr